

Remarks

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 1-9, 12, 15-20, 23-24, and 27-30 are amended and claims 31-32 are added. These amendments to the claims constitute a bona fide attempt by applicant to advance prosecution of the application and obtain allowance of certain claims, and are in no way meant to acquiesce to the substance of the rejections. Support for the amendments can be found throughout the specification (e.g., page 7, line 11 to page 8, line 15; page 9, lines 6-10), figures, and claims. Claims 1-32 are pending.

Allowable Subject Matter:

Claims 8-14 and 19-26 were indicated as being allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, first paragraph and to include all of the limitations of the base claim and any intervening claims. Applicant gratefully acknowledges this indication of allowability, and have rewritten claim 8 in independent form including all of the limitations of the base claim and any intervening claims (claims 1 and 4-7). Applicant has amended claim 8 to overcome the rejection under 35 U.S.C. § 112, first paragraph, as described below. Applicant is merely deferring the rewriting of claims 19 and 23 in independent form, pending a determination of patentability of base claim 15.

An indication of allowance of claims 8-14 is therefore respectfully requested.

Claim Objections

Claims 19 and 23 were objected to because of alleged informalities. Claims 19 and 23 have been amended to recite "calculates" rather than "calculate," as graciously suggested in the Office Action.

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Withdrawal of the objection to claims 19 and 23 is therefore respectfully requested.

Claim Rejections - 35 U.S.C. § 112

Claims 1-30 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement. The Office Action states:

Applicant discloses that a processor (112) employs only four samples of an optical pulse (130) from a sensor (124) to calculate phase angle (ϕ). However, it is unclear how and in what manner a processor (112) is used to calculate phase angle using only four samples. How is the claimed processor different from an ordinary processor? It appears that it does not matter how many samples were input into a processor as long as it uses four samples to calculate phase angle. If this is true, it appears that any ordinary processor using four samples to calculate phase angle (regardless the number of samples received by the processor) would be functionally equivalent to the claimed processor. Furthermore, it is unclear how the claimed processor would function if the claimed processor receives more than four samples. Clarification is required. (*Emphases in original.*)

Applicant has amended independent claims 1, 8, and 27 to recite "calculating the phase angle ϕ through employment of the quadrature term Q and the in-phase term I, wherein the quadrature term Q and the in-phase term I are based on the optical signal" instead of "calculating the phase angle ϕ through employment of only four samples, wherein all the four samples are based on the optical signal." Applicant has amended independent claim 15 to recite "wherein the processor component employs the quadrature term Q and the in-phase term I to calculate the phase angle ϕ , wherein the quadrature term Q and the in-phase term I are based on the optical signal" instead of "a processor component that employs only four samples to calculate the phase angle ϕ , wherein all the four samples are based on the optical signal." Thus, it is believed that this rejection is overcome and should be withdrawn.

Withdrawal of the § 112 rejections is therefore respectfully requested.

Claim Rejections - 35 U.S.C. §§ 102 and 103

Claims 1-7 and 15-18 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Hall (U.S. Patent No. 6,122,057). Claims 27-30 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hall. This rejection is respectfully, but most strenuously, traversed.

It is well-settled that there is no anticipation unless (1) all the same elements are (2) found in exactly the same situation and (3) are united in the same way to (4) perform the identical function. Since the Office Action's citations to the applied reference is missing at least one element of each of applicant's independent claims, applicant respectfully submits that the claimed invention is not anticipated by the Office Action's citations to the applied reference, as further discussed below.

Applicant respectfully submits that the Office Action's citations to the applied reference, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied reference is proper, do not teach or suggest one or more elements of the claimed invention, as further discussed below.

For explanatory purposes, applicant discusses herein one or more differences between the Office Action's citations to the applied reference and the claimed invention with reference to one or more parts of the applied reference. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to the applied reference correspond to the claimed invention.

Applicant respectfully submits that the Office Action's citations to the applied reference do not teach or suggest one or more elements of the claimed invention. A careful reading of the Office Action's citations to the applied reference fails to teach or suggest, for example, calculating the peak value I_p of the in-phase term I as

$I_p(M, \beta) = 2 \cdot B \cdot \left(\cos(M \cdot \sin \beta) - \cos\left(M \cdot \sin\left(\frac{\pi}{2} + \beta\right)\right) \right)$, wherein M is the modulation depth and β is the demodulation phase offset of the phase generated carrier, as recited in applicant's independent claim 1.

Hall (column 6, lines 12-20) discloses a peak to peak excursion:

The intervals for E_2 and O_2 follow the intervals for E_1 and O_1 by $T/4 = 82$ ns. Peak to peak excursions for quadrature and in-phase components of φ in Eqs. (9) and (10) are functions of t_0 , T and A .

$$Q_{pp}(t_0, T, \beta) := 4[O_1(t_0, T, \beta) - O_2(t_0, T, \beta)]$$

and

$$I_{pp}(t_0, T, \beta) := 4[E_1(t_0, T, \beta) - E_2(t_0, T, \beta)].$$

Hall discloses I_{pp} as $4[E_1(t_0, T, \beta) - E_2(t_0, T, \beta)]$. The Office Action's citation to Hall fails to disclose I_{pp} as $I_p(M, \beta) = 2 \cdot B \cdot \left(\cos(M \cdot \sin \beta) - \cos\left(M \cdot \sin\left(\frac{\pi}{2} + \beta\right)\right) \right)$. Simply missing from the Office Action's citation to Hall is any mention of calculating the peak value I_p of the in-phase term I :

$I_p(M, \beta) = 2 \cdot B \cdot \left(\cos(M \cdot \sin \beta) - \cos\left(M \cdot \sin\left(\frac{\pi}{2} + \beta\right)\right) \right)$, wherein M is the modulation depth and β is the demodulation phase offset of the phase generated carrier, as recited in applicant's independent claims 1 and 8. This point has even been conceded by the Office Action (page 4, section 7):

Regarding claims 8-14, the prior art fails to disclose or make obvious the claimed method comprising, in addition to the

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recited steps of the claim, the step of calculating the peak value I_p of the in-phase term I in the manner recited in claim 8.

So, the Office Action's citation to Hall fails to satisfy at least one of the limitations recited in applicant's independent claim 1.

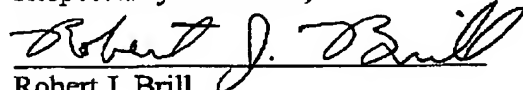
Furthermore, the Office Action does not allege that the art of record provides any teaching, suggestion, or incentive for modifying the citation to Hall to provide the claimed approach.

For all the reasons presented above with reference to claim 1, claims 1, 8, 15, and 27 are believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 1, 8, 15, and 27, as well as for their own additional characterizations.

Withdrawal of the §§ 102 and 103 rejections is therefore respectfully requested.

In view of the above amendments and remarks, allowance of all claims pending is respectfully requested. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicant's attorney.

Respectfully submitted,



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